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The Impact of ESG on Management Tone: Empirical Evidence from China

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Abstract: This paper aims to delve into the effects and mechanisms of ESG (Environmental, Social, and Governance) performance on management tone, taking a comprehensive view from psychology and behavioral finance. The study's findings shed light on the considerable impact of ESG performance on enhancing managers' enthusiasm in their speech. Interestingly, this effect is more pronounced in enterprises operating in densely populated areas. Through a meticulous mechanism analysis, it is determined that ESG performance primarily influences managers' tone through two key channels: alleviating financing constraints and bolstering financial performance. By delving into the internal logic of ESG practices on managers' emotional tendencies, this paper contributes to the existing literature from both psychological and behavioral finance perspectives. Notably, it unveils the fact that managers do not adopt a negative demeanor as a result of ESG practice. On the contrary, ESG practices have the potential to foster a positive and constructive atmosphere in managerial communication.

Keywords: ESG performance, management tone, financing constraints, financial performance, population density

1. Introduction

In recent years, ESG (Environmental Social and Governance) practices and investments have become a hot topic, and more and more companies are engaging in ESG practices. As of October 31, 2022, the number of A-share companies disclosing ESG reports has reached 1,462, accounting for 31.21% [1]. However, despite the rapid acceleration in the number of companies disclosing ESG reports in China, the disclosure ratio is still far below the international average. As Mark Murphys, the godfather of emerging market investment, said in the first "ESG Global Leaders Summit", management often fails to realize the importance of ESG, and the company's investment in ESG, such as charitable donations and green technology innovation, is destined to be difficult to recover in the short term, which conflicts with management's goal of meeting the performance criteria in the short term [2]. The attitude of management poses the most significant barrier to companies aiming to enhance their ESG (Environmental, Social, and Governance) performance. Consequently, it becomes crucial to elucidate the emotional disposition of management towards ESG in Chinese listed companies. This clarification allows for a more precise prediction of the ESG development stance of Chinese listed companies and offers empirical evidence to aid relevant departments in formulating effective measures.

Additionally, the relationship between corporate ESG development and management's emotional attitude may be influenced by population density, which plays a crucial role in environmental, demographic, and developmental pressures. It is worth noting that most existing studies on the impact of corporate ESG performance heavily rely on financial data analysis, which only captures less than 10% of the information found in annual reports of listed companies. Consequently, this limited focus on financial metrics may not provide a comprehensive understanding of the consequences resulting from corporate ESG performance. In contrast, textual data, accounting for 90% of the available data sources, has witnessed rapid advancements in text analysis technology and data processing. Therefore, leveraging textual data presents a valuable opportunity to supplement financial information and gain deeper insights into the impact of corporate ESG performance. Text analysis techniques, mainly measuring management tone with positive and negative terms, can extract positive and negative management words, i.e., management tone, from the Management's Analysis and Discussion (MD&A) section of annual reports to measure the positivity of management's sentiment toward the future [3]. The MD&A section not only contains management's plans for the next year's development but also conveys management's views on the current and future development of the company.

To address the aforementioned concerns, this study employs textual analysis methods to examine the effects and mechanisms of corporate ESG (Environmental, Social, and Governance) performance on management's current and future emotional tendencies. It adopts perspectives from behavioral finance and psychology. The findings indicate that corporate ESG performance positively influences management's perception of the present and future. This positive effect is achieved through the reduction of financing constraints and improvement in financial performance, as reflected in the Management Discussion and Analysis (MD&A) section of listed companies' annual reports.

Furthermore, the impact of corporate ESG performance on management's tone is even more pronounced in cities with higher population density where the company operates. It is worth noting that while MD&A may be more susceptible to manipulation and less regulated than financial data, factors like improving stock prices or meeting investors' expectations can potentially influence management's tone to deliberately convey positive views about the company's present and future prospects. The robustness of the results is ensured through additional tests, which involve substituting the explanatory variable of management tone, incorporating executive military experience as an executive personal attribute, considering lagged ESG variables over different time periods, and utilizing instrumental variables such as the average ESG rating within the municipality where the company is located each year.

This study makes several notable contributions when compared to existing research. Primarily, it broadens the research perspective on the outcomes resulting from corporate ESG performance. Unlike previous studies that predominantly focus on the financial or innovation dimensions of firms, this paper takes a distinct approach by examining the perceptions of corporate decision-makers regarding the consequences of ESG through the lens of managerial emotions. By exploring the affective aspect of managers' perspectives, it offers a fresh and valuable perspective on understanding the implications of corporate ESG performance.

Furthermore, this study delves deeper into the analysis of management tone. It provides an in-depth investigation into the nature and impact of management's linguistic expressions in company reports, bridging the gap in research in this area. By examining the tone and content of the Management Discussion and Analysis section, this research sheds light on the potential manipulation and effects of managerial sentiment, contributing to a more comprehensive understanding of management communication and its implications in the context of corporate ESG performance.Most of the existing studies that use management tone as an explanatory variable to predict the future performance of information risk [3] , and financial distress [4]. This paper, however, expands the perspective of management tone based research by using management tone as the dependent variable

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and as a measure of how positively management views the company in the present and future. Third, it is unclear whether management holds a positive or negative view of ESG inputs. Theoretically, ESG inputs can reduce agency problems and improve corporate efficiency [5] , but they can also take away corporate resources [6] and even become a tool for management to pursue its own interests [7] , which is a "double-edged sword", and this paper provides empirical evidence to answer this question from management's perspective based on MD&A texts.

2. Literature Review and Research Hypothesis

2.1. Literature Review

The existing literature on ESG can be broadly divided into two main categories: ESG disclosure motivations and resulting economic consequences. In terms of ESG disclosure motivations, firm-level characteristics such as size [8], industry [9] and gaining a competitive advantage [10] are key factors. Meanwhile, potential influencing factors include the role of future performance signals [10] and avoidance of strict future government disclosure regulations [11]. With regard to the economic consequences of ESG disclosure, there are positive, negative, and irrelevant findings, with most of the findings being positive. For instance, ESG disclosure can indirectly enhance the corresponding financial performance by affecting corporate surplus and customer satisfaction, among other factors [12]. However, some scholars have also identified a negative correlation between ESG and firm performance based on the profit maximization perspective [13] or not [14]. Additionally, some studies have found that the impact of ESG on firm value can vary depending on the circumstances [15]. In summary, although there is a wealth of research on the economic consequences of ESG performance, the pros and cons of ESG for firms are still not distinct. Therefore, studying the attitudes of management as ESG decision-makers may offer a new perspective.

Given the highly artistic nature of Chinese language expressions and people's ability to interpret the deeper meanings embedded in words [16], management tone is extremely valuable to the study of business. There are two perspectives on the study of management tone. First, management tone provides important incremental information, in addition to financial data, that helps predict a company's future performance. Second, the MD&A section is more flexible than financial data and lacks the constraints of the relevant legal system [17], allowing management to manipulate the tone for self-interest motives and create textual features that cater to investor preferences and meet their expectations [18]. Therefore, some scholars believe that the authenticity of MD&A texts is unpredictable and often a mixed message. In summary, under the view of incremental information, MD&A can help predict management's current and future attitudes toward the firm, but it is crucial to control for the possibility of tone manipulation by managers.

2.2. Research Hypothesis

We propose two research hypotheses to examine the relationship between corporate ESG performance and business credit financing costs.

First and foremost, according to sustainability theory, a company's capacity to maintain its operations has a direct impact on its financing costs. In this context, ESG performance acts as a practical metric that investors utilize to assess the sustainability of a company. Although implementing ESG measures may bring short-term costs, it can also help companies reduce costs and increase efficiency in the long run. Aras and Crowther [19] have shown that good corporate ESG performance is linked to better energy use efficiency and innovation performance. Technological innovations contribute to improved resource utilization and reduced unit costs. Consequently, companies that excel in ESG performance are better positioned to be competitive in the market. As a result, they are more likely to secure business credit. This correlation underscores the importance of sustainable practices in enhancing a company's market competitiveness and access to financial resources.

Secondly, information asymmetry theory suggests that the information gap between investors and enterprises hampers the development of commercial credit financing capability [20], and enhancing the transparency of enterprise information can effectively alleviate the information gap, thereby reducing the financing costs of enterprises. ESG reports provide additional information beyond financial reports disclosed by listed companies, conveying more internal information to investors such as surplus management, insider trading, and other proxy issues [21]. Simultaneously, the disclosure of ESG information can enhance analysts' focus and comprehension of a company, thereby narrowing the information gap and minimizing information asymmetry. Consequently, favorable corporate ESG performance can alleviate financing constraints by diminishing the extent of information asymmetry. ESG disclosure serves as a mechanism for enhancing transparency and promoting informed decision-making by investors and financial analysts, resulting in improved access to financing opportunities for companies with strong ESG practices.

From a psychological perspective, managers who are satisfied with the company's current operations and confident in its future tend to use a positive tone when writing annual reports. This means that the management tone not only signifies good corporate performance but also reflects the managers' true emotions [22]. Strong ESG performance not only enhances the external reputation of a company but also serves as an indicator of managerial competence. Additionally, it has the potential to alleviate financing constraints and improve financial performance, thereby alleviating both psychological and practical pressures on managers. Consequently, favorable ESG performance can bolster managers' confidence in future prospects, and this positive sentiment is likely to be reflected in the Management Discussion and Analysis (MD&A) section of the annual report.

Based on these observations, the following hypothesis is formulated:

H1a: Corporate ESG performance can increase management tone motivation.

However, based on the impression management perspective, managers might resort to qualitative tactics to subtly manipulate the company's image when the business situation falls short of investors' expectations. Such tactics may include the manipulation of annual report content, which has emerged as a significant method for managers to potentially compromise the interests of other investors. Additionally, from a self-interest standpoint, managers may engage in insider trading by manipulating the tone of the report to safeguard their positive reputation or pursue personal gains.

It is important to recognize the potential risks and ethical concerns associated with impression management practices, as they can undermine the transparency and credibility of corporate disclosures. There is empirical evidence indicating that the tone positivity of annual report texts is positively correlated with the number of shares sold by managers after the announcement of the annual report, suggesting the possibility of tone manipulation [17]. Therefore, it can be argued that ESG performance may not significantly influence managers' tone. Based on this, the following hypothesis is proposed:

H1b: Corporate ESG performance does not increase managerial tone motivation.

3. Study Design

3.1. Sample Selection

This study focuses on a sample of Shanghai and Shenzhen A-share listed companies spanning the period from 2010 to 2020. The sample selection process adhered to specific criteria: exclusion of financial and insurance companies, as well as ST and *ST listed companies. Additionally, companies with missing benchmark regression data were excluded from the sample. After applying these screening measures, a total of 19,944 sample values were obtained.

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To address the influence of extreme values, this paper applied Winsorization to all continuous variables at the upper and lower 1%. Annual report data were gathered from the Juchao Information Website, while ESG rating, corporate finance, and governance data were sourced from the CSMAR database. Population density data were obtained from the Wind database. These comprehensive data sources contribute to the robustness and reliability of the analysis conducted in this study.

3.2. Model Construction and Variable Definition

3.2.1. Model Construction

To test the effect of ESG performance on management tone, the following model is constructed:

$$\mathrm{TONE}_{i,t} = \alpha_0 + \alpha_1 \mathrm{ESG}_{i,t} + \alpha_2 \mathrm{Controls}_{i,t} + \mathrm{Industry} + \mathrm{Year} + \varepsilon_{i,t} \quad (1)$$

In equation (1), the dependent variable TONE represents management tone, while the independent variable ESG signifies corporate ESG performance. The model is also adjusted for control variables, including company size (Size), capital structure (Lev), total net asset margin (ROA), corporate growth (Growth), number of directors (Board), proportion of independent directors (Indep), top shareholder shareholding (Top1), equity balance (Balance), and ownership structure (SOE). Additionally, we control for industry and annual fixed effects.

3.2.2. Variable Definitions

(1) Management Tone: We measure optimism about the future from the perspective of behavioral finance and psychology by using Python's "Jieba" Chinese word-splitting module along with Loughran and Mcdonald's [23] dictionary translated by Youdao Dictionary to automatically classify the text content of "Management Discussion and Analysis" in annual reports of listed companies. We use Henry [24], Price et al.'s [1] formulas to construct TONE1 and TONE2:

$$\mathrm{TONE1} = \frac{(\mathrm{POST}-\mathrm{NEG})}{(\mathrm{POST}+\mathrm{NEG})} \quad (2)$$

$$\mathrm{TONE2} = \ln\frac{(1+\mathrm{POST})}{(1+\mathrm{NEG})} \quad (3)$$

Here POST indicates the number of positive emotion words, and NEG signifies the number of negative emotion words. The TONE indicator is positively correlated with management tone positivity; a higher Tone value reflects a more optimistic management mindset.

(2) ESG Performance: We use the ESG rating index of China Securities to proxy for enterprise ESG performance in this paper. The index is based on the ESG rating models of Europe and the United States while considering the local characteristics of China, with broader coverage and a longer period of assessment. Specifically, we use the CSI ESG rating where "C to AAA" represents the lowest rating and "1 to 9" indicates the highest rating.

3.3. Descriptive Statistics

Table 1 presents the descriptive statistics for the key variables. The mean values of management tone (TONE1 and TONE2) are 0.391 and 0.795, respectively. The minimum values are 0.045 and -0.588, indicating that the number of positive words in both management discussion and analysis texts is greater than the number of negative words, and the overall management tone is positive. The mean value of ESG is 6.531, with a maximum value of 9 and a minimum value of 1, implying significant

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differences in ESG performance among different companies. However, the overall performance is favorable.

Table 1: Descriptive statistical analysis of key variables.

Variables	Number of samples	Average value	Standard deviation	Minimum value	Maximum value
TONE1	19,944	0.391	0.133	0.045	0.705
TONE2	19,944	0.795	0.605	-0.588	2.639
ESG	19,944	6.531	1.193	0	9
Size	19,944	22.39	1.297	19.480	26.240
Lev	19,944	0.466	0.208	0.066	0.966
ROA	19,944	0.033	0.068	-0.299	0.216
Growth	19,944	0.178	0.557	-0.629	4.070
Variables	Number of samples	Average value	Standard deviation	Minimum value	Maximum value
Board	19,944	2.143	0.198	1.609	2.708
Indep	19,944	0.375	0.054	0.333	0.571
Top1	19,944	0.340	0.147	0.085	0.733
Balance	19,944	0.659	0.570	0.025	2.615
SOE	19,944	0.468	0.499	0	1

4. Analysis of the Empirical Results

4.1. Corporate ESG Performance and Management Tone: A Test of Aggregate Effects

Table 2 presents the regression results of firm ESG performance on management tone. Columns (1) and (3) show the regression results of ESG on management tone, controlling only for industry and year fixed effects. The coefficients of ESG and TONE1, as well as TONE2, are 0.017 and 0.046, respectively, and both are significant at the 1% level, indicating a tentative positive effect of ESG on management tone. Columns (2) and (4) show the regression results after adding control variables, and the coefficients of ESG with TONE1 and TONE2 are 0.007 and 0.017, respectively, with both being significant at the 1% level. These results indicate that better ESG performance of a company is associated with more optimistic views from management regarding the company’s current and future prospects. These findings support hypothesis H1a.

Table 2: Regression results of ESG and management tone.

Variables	(1)	(2)	(3)	(4)
	TONE1	TONE1	TONE2	TONE2
ESG	0.017***	0.007***	0.046***	0.017***
	(0.0007)	(0.0008)	(0.0033)	(0.0036)
Constant	0.392***	0.163***	0.750***	0.015
	(0.0114)	(0.0199)	(0.0513)	(0.0913)
Controls	NO	Yes	NO	Yes
Year & Ind	Yes	Yes	Yes	Yes
N	19,944	19,944	19,944	19,944
R-squared	0.221	0.294	0.239	0.284

Note: *, ** and *** indicate significant at the 10%, 5% and 1% levels, respectively, with standard errors in parentheses. Same below.

4.2. Corporate ESG Performance and Management Tone: A Test of Mediating Channel Effects

In this section, we examine the mediating channel effects of corporate ESG performance on management tone, in accordance with theoretical derivation of hypothesis H1. Corporate ESG performance may impact management tone in two ways: (1) by demonstrating good sustainability and reducing information asymmetry, ESG performance can lower financing constraints, thus increasing management's optimism about future corporate development; and (2) by improving financial performance through promoting innovation performance, enhancing resource efficiency, and so on, ESG performance can increase management's optimism about current corporate development.

We first examine the mediating effect of financing constraints, using the KZ index and WW index as proxies, which are commonly used to measure the degree of financing constraints [25]. Since the relationship between ESG and management tone has been established in the previous section, it will not be repeated here. As shown in Table 3, columns (1) and (4) indicate that ESG has a significantly negative effect on both KZ and WW, demonstrating that corporate ESG performance can reduce financing constraints. Moreover, columns (2), (3), (5), and (6) reveal that both KZ and WW indexes are negatively significant for management tone proxies, TONE1 and TONE2, implying that financing constraints decrease management optimism about the future of the firm. These results confirm the path of "corporate ESG performance → (lower) financing constraints → (higher) management tone," suggesting that enhancing corporate ESG performance can improve executives' positive perceptions of corporate future by decreasing financing constraints, which is reflected in the MD&A text of annual reports.

Table 3: Tests of mediating effects of financing constraints.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	KZ	TONE1	TONE2	WW	TONE1	TONE2
KZ		-0.003***	-0.008***			
		(0.0007)	(0.0031)			
WW					-0.005*	-0.045***
					(0.0028)	(0.0128)
Variables	(1)	(2)	(3)	(4)	(5)	(6)
	KZ	TONE1	TONE2	WW	TONE1	TONE2
ESG	-0.019**	0.007***	0.017***	-0.004**	0.007***	0.016***
	(0.0083)	(0.0008)	(0.0036)	(0.0020)	(0.0008)	(0.0036)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year & Ind	Yes	Yes	Yes	Yes	Yes	Yes
N	19,944	19,944	19,944	19,944	19,944	19,944
R-squared	0.659	0.295	0.284	0.331	0.294	0.284

Secondly, we examine the mediating effect of financial performance. Building on Huihua Nie et al.'s (2022) [26] study, we conducted a three-stage test using corporate return on assets (ROA) and return on net assets (ROE) as proxies for corporate financial performance. As presented in Table 4, columns (1) and (4) indicate that ESG has a significantly positive effect on both ROA and ROE at the 1% level, suggesting that improving corporate ESG performance can enhance financial performance. Moreover, columns (2), (3), (5), and (6) demonstrate that the proxies for management tone, TONE1 and TONE2, exhibit significantly positive coefficients at the 1% level for ROA, ROE, and ESG. This confirms the path of "corporate ESG performance → (improved) financial performance → (improved) management tone," implying that enhancing corporate ESG

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performance can lead to executives' more positive views of their companies' future through improved financial performance, which is reflected in the MD&A text of annual reports.

Table 4: Tests for mediating effects of financial performance.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	ROA	TONE1	TONE2	ROE	TONE1	TONE2
ESG	0.006***	0.007***	0.017***	0.011***	0.008***	0.019***
	(0.0004)	(0.0008)	(0.0036)	(0.0009)	(0.0008)	(0.0036)
ROA		0.439***	1.578***			
		(0.0136)	(0.0625)			
ROE					0.186***	0.660***
					(0.0062)	(0.0282)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year & Ind	Yes	Yes	Yes	Yes	Yes	Yes
N	19,944	19,944	19,944	19,944	19,944	19,944
R-squared	0.271	0.294	0.284	0.203	0.290	0.281

4.3. Corporate ESG Performance and Management Tone: A Test of Moderating Effects

As the world population continues to grow, population density has become an important factor influencing ecological and environmental patterns in the pursuit of sustainable development [27]. Therefore, in balancing population, environment, and economic development concerns, population density has become a crucial parameter for local governments to consider when addressing ESG development pressure. In this regard, we sought to determine whether management would be more sensitive to corporate ESG performance under population density pressure. The regression results are presented in Table 5. Notably, the interaction term PD_ESG is significantly positive with TONE1 and TONE2 at the 1% and 5% levels, respectively, implying that population density further strengthens the positive relationship between corporate ESG performance and management optimism. Specifically, the positive correlation between the degree of management optimism and ESG performance is enhanced even more by population density. Precisely, the higher the population density, the greater the pressure on firms to meet local sustainability objectives. As such, when firms demonstrate better ESG performance, management of firms located in highly populated areas will exhibit greater optimism about the future.

Table 5: Tests for moderating effects of population density.

Variables	(1)	(2)
	TONE1	TONE2
ESG	0.004***	0.006
	(0.0013)	(0.0059)
PD	-0.027***	-0.085**
	(0.0081)	(0.0373)
PD_ESG	0.004***	0.012**
	(0.0012)	(0.0055)
Controls	Yes	Yes
Year & Ind	Yes	Yes
N	17,559	17,559
R-squared	0.296	0.281

Note: Population density is missing in Xinjiang and Tibet, so the sample size has been reduced.

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4.4. Robustness Test

4.4.1. Proxy Variables for Corporate ESG Performance

To capture corporate ESG performance, we followed the method of Chen, Xiaoshan and Liu, Hongduo [28] and summed the dummy variables for the six elements of product advantage, philanthropic volunteer activities, social controversy advantage, diversity advantage, corporate governance advantage, employee relations advantage, and environmental advantage in the CNRDS database as proxy variables (CNRESG). As shown in columns (1) and (2) of Table 6, replacing the variables of corporate ESG performance did not alter the conclusions drawn in this paper.

4.4.2. Proxy Variables for Management Tone

The full textual tone of listed companies' annual reports was adopted as a proxy variable for management's tone. Since annual reports, as an important means for management to disclose the company's business status to the public, may also be influenced by managers in parts other than MD&A, we used Price et al.'s [1] approach to measure management tone using (number of positive words - number of negative words)/total number of words and (number of positive words - number of negative words)/(number of positive words + number of negative words). Replacing the variables of management tone did not affect the findings of this paper, as presented in columns (3) and (4) of Table 6.

4.4.3. Endogeneity Test

Firstly, we tested the issue of omitted variables. Davis and Angela et al. [29] have shown that personal characteristics of executives may impact management tone. Thus, following Yuanfang Wang [30], we included the dummy variable of chairman's military experience (1 for chairman with military experience, 0 otherwise) as a control variable for testing. Secondly, as management tone is susceptible to manipulation, we added the variable of management tone manipulation ABTONE, using He Kang and Wan Li-Mei's approach. Finally, to test whether management honestly expresses its emotional disposition towards the firm's present and future, we measured corporate integrity culture in four dimensions according to Zuo et al. [31]: whether the cultural propaganda contains words related to integrity connotation (with 0, otherwise with 1), new lawsuits and become defendants, fine expenditures, and public censure of executives, and included integrity culture CX in the model for testing. Columns (5) and (6) of Table 6 demonstrate that our conclusions remain robust after adding the three control variables of executives' military experience, management tone manipulation, and corporate integrity culture.

Table 6: Robustness test regression results.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	TONE1	TONE2	YD1	YD2	TONE1	TONE2
CNRESG	0.029***	0.046**				
	(0.0048)	(0.0227)				
ESG			0.001***	0.008***	0.002***	0.006*
			(0.0001)	(0.0009)	(0.0002)	(0.0033)
ABTONE					0.964***	1.821***
					(0.0022)	(0.0305)
CJ					0.007***	-0.006
					(0.0013)	(0.0184)
CX					0.007***	0.012**

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Table 6: (continued).

					(0.0004)	(0.0059)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year & Ind	Yes	Yes	Yes	Yes	Yes	Yes
N	6,112	6,112	19,944	19,944	19,944	19,944
R-squared	0.337	0.296	0.309	0.373	0.934	0.393

Note: CNRESG has a reduced sample size due to missing data required in CNRDS.

Secondly, lagging the explanatory variables can help alleviate the problem of two-way causality. To address this in our study, we lagged the independent variable ESG by one and two periods. As illustrated in Table 7, regression outcomes for lagged one period are presented in (1) and (2), while regression results for lagged two periods are displayed in (3) and (4). Both the lagged ESG and management tone (TONE1 and TONE2) are notably and positively associated at the 1% level, suggesting that the baseline regression findings remain robust.

Table 7: Robustness test regression results.

Variables	(1)	(2)	(3)	(4)
	TONE1	TONE2	TONE1	TONE2
ESG	0.006***	0.014***	0.006***	0.012***
	(0.0009)	(0.0039)	(0.0009)	(0.0043)
Controls	Yes	Yes	Yes	Yes
Year & Ind	Yes	Yes	Yes	Yes
N	16,682	16,682	14,221	14,221
R-squared	0.260	0.280	0.237	0.273

Note: The sample size was reduced because the ESG was lagged by 1 and 2 periods, respectively.

Finally, we utilized the instrumental variable method. Based on Benlemlih and Bitar [32], we selected the mean value of the ESG rating of the firm's location city in each year (IV_ESG) as an instrumental variable. The ESG performance of each firm is influenced by the ESG performance of listed companies within the local municipality where it is located, satisfying the relevance requirement. Meanwhile, the ESG rating of firms within the local municipality where it is located is not directly related to the firm's development and management's optimism, satisfying the exogeneity requirement. Therefore, we employed 2SLS for the regression of instrumental variables, and column (1) of Table 8 presents the regression results of the first stage, indicating that IV_ESG satisfies the relevance requirement as it is significantly positive at the 1% level. Columns (2) and (3) display the regression results of the second stage, and ESG is significantly and positively correlated with TONE1 and TONE2 at the 1% level, indicating that the findings of this paper are robust.

Table 8: Regression results of the instrumental variables method.

Variables	(1)	(2)	(3)
	ESG	TONE1	TONE2
ESG		0.009***	0.024***
		(0.0020)	(0.0091)
IV_ESG	0.793***		
	(0.0123)		
Controls	Yes	Yes	Yes
Year & Ind	Yes	Yes	Yes
N	19,944	19,944	19,944
R-squared	0.387	0.291	0.280

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5. Research Conclusions and Implications

This article delves into the influence and underlying mechanisms of corporate ESG performance on management tone, employing the perspectives of psychology and behavioral finance. Through empirical analysis, this study reveals a noteworthy positive impact of corporate ESG performance on management tone. More specifically, enhanced corporate ESG performance is associated with a more positive management tone, and this relationship is mediated through two key paths: mitigating financing constraints and improving financial performance.

Moreover, it is observed that the positive effect of corporate ESG performance on management tone positivity is amplified in regions characterized by higher population density. This finding highlights the contextual factors that can potentially influence the relationship between corporate ESG performance and management communication practices.

These findings shed light on the intricate interplay between corporate ESG performance, management tone, and the broader business environment, emphasizing the relevance of psychological and behavioral dynamics in shaping corporate communication strategies.

In the section dedicated to robustness testing, this paper enhances the reliability of its findings by incorporating additional control variables. These variables include management tone manipulation, corporate integrity culture, and managers' military experience. The analysis also incorporates lagged explanatory variables for both one-period and two-period lags. Additionally, an instrumental variable approach is employed, utilizing the mean ESG score of the prefecture-level city where the firm is situated.

The results of these robustness tests further strengthen the conclusion that corporate ESG performance has the capacity to bolster management's optimism regarding the present and future prospects of the firm. Notably, these findings hold even after excluding instances of management tone positivity manipulation from a self-interest standpoint.

By considering and accounting for various factors and employing rigorous statistical methods, this paper ensures the credibility and validity of its conclusions. The robustness tests serve to reinforce the initial findings, highlighting the positive impact of corporate ESG performance on management outlook and sentiment.

The findings presented in this article carry several significant implications. Firstly, they shed light on the underlying mechanism and empirical evidence supporting the notion that corporate ESG performance plays a pivotal role in fostering positive management sentiment. This, in turn, has the potential to shift managers' focus from solely pursuing corporate profit maximization to a broader perspective of stakeholder value maximization.

Secondly, these findings provide sound reasoning and support for the ongoing adoption of ESG practices within companies. It underscores the essential role these practices play in facilitating sustainable economic development, considering the long-term implications and benefits they bring.

Thirdly, the study highlights that the market-oriented mechanism, while distinctly characterized by its Chinese context, does not excessively burden management. This is due, in part, to the political inclination towards ESG development and sustainable growth. This insight further strengthens the case for the incorporation of ESG considerations within corporate management strategies.

Lastly, the research emphasizes the significance of achieving a harmonious coexistence between humans and nature. The heightened sensitivity towards ESG performance by corporate management in areas with higher population density underscores their commitment towards contributing to sustainable development efforts.

Overall, these implications instill a greater understanding of the multifaceted impact of corporate ESG performance, encouraging companies to prioritize stakeholder value, contributing to sustainable

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economic growth, and recognizing the importance of environmental and social considerations in their decision-making processes.

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